

NCAR GV High Spectral Resolution Lidar Design Review

GV HSRL Typical Flight Operations

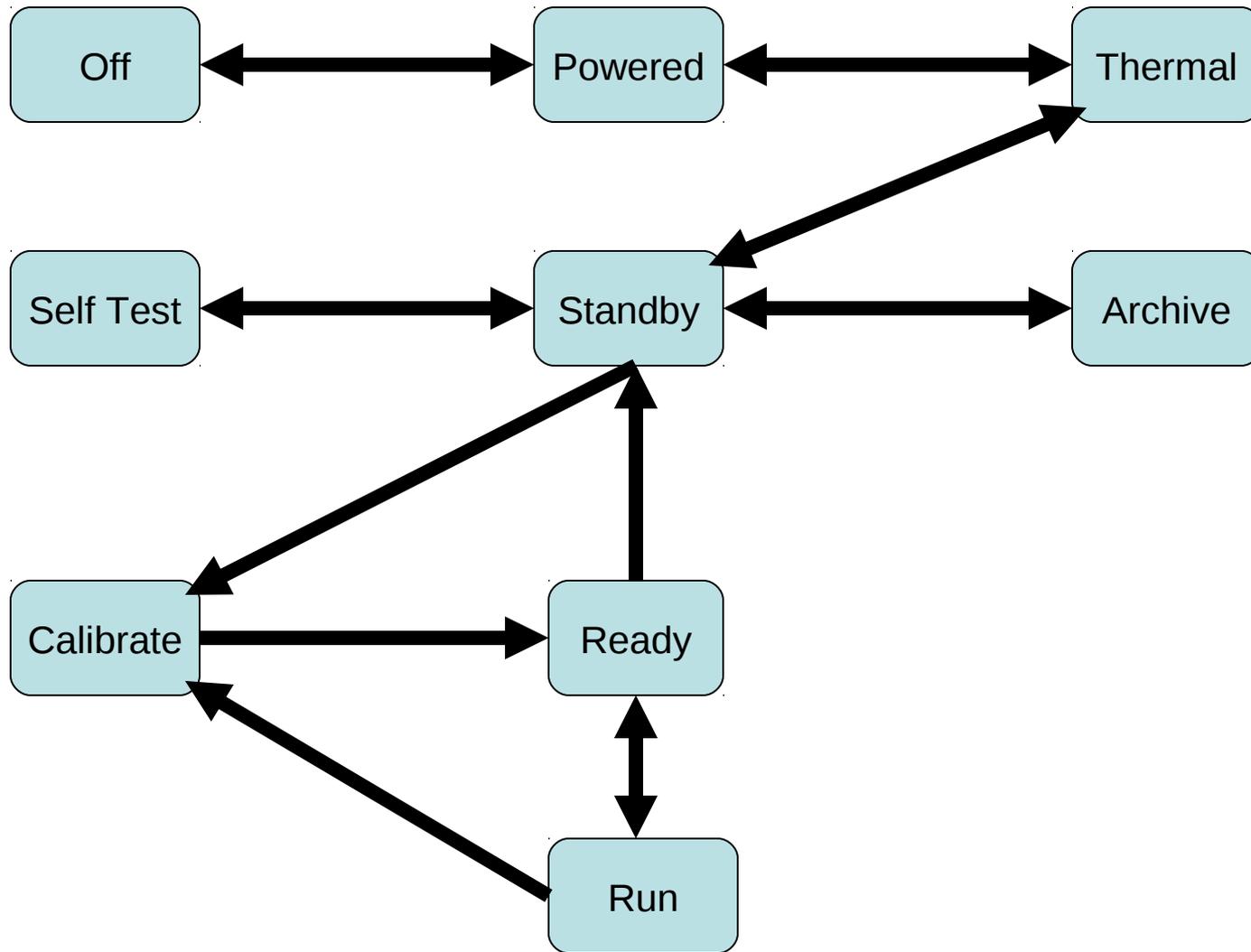


22 August 2007
NCAR - Boulder, CO



*University of Wisconsin
Space Science and Engineering Center*

GV HSRL State Diagram



A Typical Day of GV HSRL Flight Operations

Step	Time	Mode	GV HSRL Condition	Details
1.	-	Off	No power to the instrument.	Upon opening the GV aircraft, apply ground power as soon as possible.
2.	-	Powered	Power applied to instrument.	Apply power to instrument as soon as possible after opening the GV to automatically power make-up air fans for contamination control.
3.	-	Thermal	Min. thermal control systems on.	Turn on minimum thermal control systems, which begins autonomous control of the optical bench enclosure and iodine cells' thermal systems when the temperature is outside of the operating norms.
4.	D -1.5H	Standby	All systems powered on.	All systems powered, including computer, laser systems, detectors, etc. Output beam blocked to telescope and shutter to APD detectors is shut. Monitoring of the system can now begin using the web via any computer connected to the local network in the GV aircraft.
5.	D -1.3H	Self Test	Internal checks for the instrument.	Verify system is functional, but not in frequency lock or calibration yet.
6.	D -1.1H	Standby	All systems powered on.	Start GV APU and/or GV engines.
7.	D -1.0H	Standby	All systems powered on.	Transition from ground power to internal GV power. Instrument UPS will momentarily handle any power interruptions.
8.	D -0.8H	Standby	All systems on.	Aircraft roll-out and take-off. Telescope and APD detectors shutters closed.
9.	D -0.4H	Standby	All systems on.	Manually orient the telescope to the desired window. Verify the instrument is at it's thermal set points.
10.	D -0.3H	Calibrate	Instrument calibration cycle.	Shutter to the telescope is closed.
11.	D -0.1H	Ready	Ready to run, shutters closed.	Calibration done, ready to run. Shutter to the telescope is closed.



A Typical Day of GV HSRL Flight Operations (Cont.)

<u>Step</u>	<u>Time</u>	<u>Mode</u>	<u>Condition</u>	<u>Details</u>
11.	D -0.1H	Ready	Ready to run, shutters closed.	Calibration done, ready to run. Shutter to the telescope is closed.
12.	D 0.0H	Run	Atmospheric Data Operations	Set mode to Run for data collection mode, shutters open, light to/from the telescope and to the detectors.
13.	D+x.0H	Ready	Shutters closed automatically.	Shutter to the telescope is automatically closed because of a maneuver or aircraft/telescope orientation that would allow sunlight to enter the optical axis of the telescope during the day time. This shutter could also be programmed to close for other flight conditions as requested.
14.	D+x.1H	Run	Atmospheric Data Operations	Data collection mode, shutters automatically open, light to/from the telescope.
15.	D+5.3H	Standby	All systems on.	Set mode switch to Standby. Shutters closed.
16.	D+5.7H	Standby	All systems on.	Begin aircraft descent, landing and taxi. Shutters closed.
17.	D+6.3H	Standby	All systems on.	Begin thermal conditioning to current ambient conditions.
18.	D+6.4H	Archive	Data Archival	Archival download of data files if not already done while in the air.
19.	D+6.6H	Powered	A/C power applied to instrument.	Make-up air fans powered up to control contamination until aircraft is closed whenever possible.
20.	D+7.0H	Off	Off	No power to the instrument. Close up aircraft, remove ground power, end operations in GV when possible.

